Habitat Expansion Agreement

for

Central Valley Spring-Run Chinook Salmon and California Central Valley Steelhead

Questionnaire Instructions

The attached questionnaire is intended to solicit information needed by the Steering Committee to review projects relative to the criteria established in the Habitat Expansion Agreement. For each proposed action (project), please complete the questionnaire to the fullest extent possible. Please provide citations where applicable and provide a full reference for each citation at the end of this questionnaire (Section X. Supporting Documents). Specific instructions follow.

I. Contact Information

Provide the name of the agency or group making the proposal as well as a contact person for the project. Include contact information such as mailing address, phone number, and email address.

II. Project Description

Provide a descriptive name for the action (project). If the action is listed in the *Working List of Potential Habitat Expansion Actions* (provided during the January 2009 meetings of HEA parties), please include the reference number associated with the action. The project location should specify the watershed or subwatershed (e.g., Deer Creek, Beegum Creek) as well as specific areas within the watershed where the project will be located and what portions of the watershed will benefit from the project. Please include geographic coordinates of the project location(s), if applicable. The project description should be a narrative that provides as much detail as possible about the project.

III. Species Limiting Factors

In this section, indicate the factors that currently limit production of spring-run Chinook salmon and/or steelhead in your watershed. The intent is that the environmental and biological objectives of your project address these limiting factors in some way. Please check one or more of the limiting factors that apply to your watershed. In the second column, describe how and where the factor limits spring-run Chinook salmon and/or steelhead. For each factor that you check, please rank its effect on spring-run Chinook salmon and/or steelhead using the drop-down box in the last column. Finally, we also ask that you describe the source of your conclusions, such as a watershed assessment or other document. Please provide enough information that we can find the document if we need it.

IV. Project Objectives—Environmental

Environmental objectives describe how the project is intended to address the limiting factors to achieve the biological objective described in the next section. Environmental objectives should be as specific and quantitative as possible (e.g., reduce gravel embeddedness in the watershed from 75% to 25% by fencing riparian areas to exclude cattle and allow riparian forest to reestablish). Describe how you think environmental objectives relate specifically to the biological objectives. In the last column, we ask you to describe the environmental objectives as either the primary or secondary focus of the project. For example, a project to plant trees might have a primary focus on riparian/floodplain function with a secondary focus on temperature or water quality.

V. Project Objectives—Biological

Biological objectives describe the anticipated biological response from the project and should be as quantitative as possible. Indicate which species and life stages are the focus of the project. Describe specifically the general condition of the target species in your watershed relative to the historical abundance. The condition of the species should be indicated using the categories in the drop-down box. Species condition categories are defined on the last page of this form. Biological objectives should include the following information: (1) an estimate of the expected contribution of the project in terms of potential adult returns, to the extent possible (and an explanation of how the estimate was developed); and (2) an explanation of how the biological objective for the species is addressed by the action relative to the environmental limiting factors (e.g., the biological objective of an action might be to increase egg incubation survival in a watershed that is currently limited by sediment levels).

VI. Project Cost

To the extent possible, estimate the capital cost of the project, the annual operating and maintenance (O&M) cost, a description of annual O&M activities, and the project lifetime (i.e., how many years O&M activities are expected, including indefinitely, and how long until you expect the project to provide benefits). Provide any confirmed or potential funding partners, or opportunities for cost sharing with other funders or between projects. Also, identify any confirmed or potential partners that might provide maintenance support for the project (funding support or labor support).

VII. Schedule

Describe the project schedule, including a potential start date, construction period, and environmental and biological response times (i.e., the expected time to realize environmental and biological benefits). The last points refer to the maturation period for the project during which time environmental conditions develop. For example, it may take 50–100 years before full environmental benefits (e.g., shading, channel stability, water quality) of planting riparian trees are realized.

VIII. Feasibility

Describe the feasibility and challenges of the project. Feasibility issues should include primarily technical issues, success of projects utilizing similar technology, and particular challenges posed by the specific project. Other issues of feasibility that may be included are challenges associated with property ownership, permitting, zoning, and other social-economic-legal issues.

IX. Project Support

Describe the support or potential conflicts associated with the project. Specifically, provide supporting and cooperating entities (e.g., agencies, non-governmental organizations). Are there cooperating agencies or groups, aside from the potential funding partners mentioned previously? Describe the degree of local support and any known opposition or conflicts with other parties.

X. Supporting Documents

Provide full references for each citation used to support the information presented in this questionnaire for your project. At a minimum, a reference should include the author(s) name; name of agency/organization (if applicable); title of the document; volume and title of journal, if the document is taken from a professional journal; and publisher, date, and location of publication.

Questionnaire

for

Information on Potential Projects to Support Spring-Run Chinook Salmon and Steelhead in the Sacramento River Basin for the Habitat Expansion Agreement

DUE: Thursday, April 30, 2009

Send completed questionnaires to hea@water.ca.gov

I. Contact Information

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Organization:	Western Shasta Resource Conservation District
Address:	6267 Parallel Road
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Phone Number:	530-365-7332 ext. 202
Email Address:	mary@westernshastarcd.org

II. Project Description

Project Name:	Rehabilitation of Lower Clear Creek Spring-Run Salmon Spawning Habitat
Reference No. or New:	New
Project Location:	The augmentation sites are located in the upper portion of Lower Clear Creek (40 33055.65; 122 3153.6) beginning at the Clear Creek Road Bridge and upstream to the Whiskeytown Dam. This section has been identified as the key habitat in Lower Clear Creek for Spring-Run Chinook salmon.

Project Description:

Lower Clear Creek has an extensive history of land-use impacts, including gold and aggregate mining, timber harvest, and construction of dams for water and power generation dating from 1848. Prior to this, Clear Creek provided excellent habitat for fall run, late fall run, and Spring-Run Chinook salmon and Central Valley steelhead. The effects of gold mining and aggregate extraction included: 1) substantial modification of plant form and cross-sectional dimensions, resulting in sections of unstable, braided channels; 2) large in-channel and floodplain pits that entrap juvenile salmonids and support populations of predator fish; 3) permanent channel diversion into bedrock

II. Project Description

bypass channels; 4) impedance of bedload transport and spawning gravel supply; and 5) reduction in spawning riffle areas. Flow regimes were also negatively impacted by construction of Saeltzer and Whiskeytown Dams. Lower Clear Creek was a "watershed turned upside down" which drastically reduced quality and quantity of spawning and food producing habitats within the stream channel. In fact, Spring-Run Chinook salmon were thought to be extirpated from the system.

Lower Clear Creek restoration work began in earnest in the mid-1990's and continues to the present time. BLM spent over $7 million to acquire the floodplains and riparian areas along the creek to protect the restoration work in perpetuity, the Western Shasta Resource Conservation District (RCD) was chosen as the local delivery vehicle for the many projects that would make up the restoration of Lower Clear Creek, and flows were increased from Whiskeytown Dam.

Restoration projects have included gravel augmentations, fuels reductions, erosion controls, removal of Saeltzer Dam in 2000 by CA Dept. of Fish and Game, riparian revegetation plantings, and reconfiguration of braided flood plains. To date, over 100,000 tons of gravel have been injected into Lower Clear Creek. In concert with other restoration activities, dramatic improvement has been noted. This proposed augmentation of spawning gravel will build upon the previous efforts to restore and maintain anadromous salmonid habitat, and ultimately the target species. There are eight (8) specific spawning gravel augmentation sites in this proposed action. All gravel will be washed at least once and have a cleanliness value allowing basin water quality standards to be maintained in order to avoid adverse impacts from sedimentation. The proposed spawning gravel augmentation will restore natural processes and provide immediate ecological benefit for anadromous salmonids in Lower Clear Creek.

III. Species Limiting Factors

In this section, describe the limiting factors for spring-run Chinook salmon and steelhead in your watershed. The last page of this questionnaire defines the limiting factors.

Limiting Factors	Description (from back page)	Rank
☐ **Channel Form**		Select Rank
☒ **Channel Unit Types**	Lack of spawning gravel in riffles	Critical
☒ **Substrate**	Lack of spawning gravel recruitment due to entrapment by Whiskeytown Dam	Critical
☐ **Structure**		Select Rank
☐ **Flow**		Select Rank
☐ **Temperature**		Select Rank
☐ **Water Quality**		Select Rank
☐ **Passage**		Select Rank
☐ **Riparian/Floodplain**		Select Rank

Source Documents:

Please see the documents listed under X. Supporting Documents

Additional Notes:

IV. Project Objectives—Environmental

In this section, describe how your project will affect one or more of the limiting factors for spring-run Chinook salmon or steelhead described above.

Limiting Factor	Description and Objective	Focus
☐ **Channel Form**		Select Focus
☒ **Channel Unit Types**	Spawning gravel augmentaton will help meet the objective of replacement and retention of spawning gravel in riffles.	Primary
☒ **Substrate**	Spawning gravel augmentation will help meet the following objectives which will ultimately result in increased Spring-Run Chinook salmon numbers: - Restore the sediment transport processes, including coarse bedload transport continuity and fine sediment deposition on floodplain surfaces. - Improve spawning habitat conditions for anadromous salmonid species, including Central Valley fall-run and late fall-run Chinook salmon, Central Valley spring-run Chinook salmon and Central Valley steelhead/Sacramento River rainbow trout.	Primary
☐ **Structure**		Select Focus
☐ **Flow**		Select Focus
☐ **Temperature**		Select Focus
☐ **Water Quality**		Select Focus
☐ **Passage**		Select Focus
☐ **Riparian/Floodplain**		Select Focus

V. Project Objectives—Biological

In this section, describe the objective(s) of your project relative to the goal of providing habitat for spring-run Chinook salmon and steelhead. Indicate the species and life stage that are targeted by the project. (It is okay to have more than one species/life stage target).

Target Species: ☒ Spring-Run Chinook Salmon **Population Status Specific to Watershed:** Increasing

Target Life Stages:

☒ Spawning ☐ Egg Incubation ☐ Summer Rearing ☐ Winter Rearing

☐ Juvenile Emigration ☐ Adult Immigration ☐ Adult Holding

Description of Project Objectives:

- Continue to augment spawning gravel at those sites in Lower Clear Creek that have demonstrated the ability to

V. Project Objectives—Biological

route gravel downstream to improve spawning habitat. (Clear Creek is generally gravel deficient. Several augmentations have been undertaken and combined with other rehabilitation efforts, great success has been achieved)

- Maintain the upward trend of anadromous salmonids returning to Clear Creek to spawn as compared to other tributaries in the Sacramento River Watershed. (Based on the 2008 population data results, Clear Creek exceeds all other spawning tributaries in the percentage of adults returning to spawn)

- Restore healthy populations of adult anadromous salmonids in Lower Clear Creek to 10,000 to 15,000 adults in 5 years. The adult Spring-Run Chinook population presently exists in lower Clear Creek at low numbers but appears to be increasing. From 20 to 200 adult Spring-Run Chinook salmon have been counted in Lower Clear Creek annually during the past 8 years (Newton and Brown 2004, M. Brown, pers. comm.). Chinook escapement numbers into Lower Clear Creek were as high as 16,071 in 2004 prior to the precipitous decline throughout the Sacramento River Watershed.

Target Species: ☒ Steelhead

Population Status Specific to Watershed: Stable

Target Life Stages:

☒ Spawning ☐ Egg Incubation ☐ Summer Rearing ☐ Winter Rearing

☐ Juvenile Emigration ☐ Adult Immigration

Description of Project Objectives:

Numbers are not known for steelhead, but beneficial impacts to Central Valley steelhead from the implementation of spawning gravel augmentation would be similar to the impacts to Central Valley Spring-Run salmon. The overall impacts to steelhead are considered to be beneficial, long-term in duration and major in intensity.

VI. Project Cost

Capital Cost:	$605,320
Annual Operation and Maintenance Cost:	Unknown
Annual Operation and Maintenance Description:	Maintenance would be continued spawning gravel augmentation annually until the objectives are met.
Project Lifespan:	Unknown, depends on water flows
Project Partners (Funding):	
Project Partners (Maintenance):	

VII. Schedule

Proposed Start:	May 1 to June 15, 2010 (Work needs to be started after May1 and concluded before August 31 to avoid conflicts with spawning runs. Work will take up to 10 weeks to complete. If it cannot be completed before August 31, 2010, work would be suspended and completed before August 31, 2011.
Expected Time to Completion:	August 31, 2010
Expected Time to Realize Environmental Benefits:	Immediate for the augmentation sites and below. However, since Lower Clear Creek is generally sediment depleted, it may take several years or decades to fully recharge and achieve full sediment routing throughout Lower Clear Creek.
Expected Time to Realize Biological Benefits:	Immediate spawning benefits for the stretchs that the gravel has been routed to below the augmentation sites.

VIII. Feasibility

Technical Feasibility:	Many of the sites have had prior augmentations. Augmentation is a proven and cost effective method to improve and maintain spawning habitat.
Technical Challenges:	None
Related Projects:	Saltzer Dam removal; Phases 1, 2, and 3 Lower Clear Creek Floodplain Rehabilitation Projects, Riparian vegetation plantings, Fuels reduction plan, Avi fauna, geomorphologic, and riparian vegetation monitoring studies.
Ownership or Permitting Challenges:	None, minor consultation will be necessary to extend the permits past the end of 2009.
Conflicts with Cultural, Zoning, or Other Issues:	None

IX. Project Support

Supporting Entities:	Western Shasta RCD has received grants for LCC restoration from BLM, USFWS, BOR, NPS, CDFG, NOAA, NRCS, CALFED, EPA, DWR, SWRCB, NFWF, Shasta County, Metropolitan Water District, USFS.
Cooperating Entities:	Same
Degree of Local Support:	Local support for the restoration efforts is outstanding. To date the RCD has been awarded 74 grants for LCC restoration since 1995 totalling $14,952,695. Recently 63 people, including County Supervisors and city councilmen, attended the ribbon cutting for the BLM Saeltzer Gorge Overlook and Picnic Area in 2008.
Known Opposition:	None

X. Supporting Documents

Please provide a full reference for each citation used to support the information presented in this questionnaire.

CA Department of Water Resources, 1985, Clear Creek Flsiery Study: Instream Flow Needs, Appendix

US Fish & Wildlife Service, 1995, Benefits of IncreasedMiminum Instream Flows on Chinook Salmon and Steelhead in Clear Creek, Shasta County, California

Brondyke, Aaron, 1995, Lower Clear Creek Watershed Erosion & Sedimentation

Western Shasta RCD, 1996, Lower Clear Creek Watershed Analysis

USDA NRCS, 1996, Lower Clear Creek Sediment Budget Report

Western Shasta RCD, 1997, Final Report: Lower Clear Creek Spawning Gravel Restoration Pilot Project, 1996-1997

USDA NRCS, 1997, Procedure for Determining Flows to Maintain Chinook Redds on Lower Clear Creek

Western Shasta RCD, 1997, Pilot Project Final Report on Lower Clear Creek Spawning Gravel from 1996-1997

Western Shasta RCD, 1998, Lower Clear Creek Watershed Management Plan

Kondolf, G. M.; Williams, J. G., 1998, Flushing Flows: A Review of Concepts to Clear Creek

USDI Bureau of Reclamation, 1998, Clear Creek Hydraulic Analysis of restoration Project Phase 1

Western Shasta RCD, 1999, The Conceptual Plan for Restoration of the Lower Clear Creek Floodway

Bureau of Land Management, 1999, The Redding Field Office Resource Management Plan and Final Record of Decision

Kondolf, G. Mathias, U C Berkeley, 1999, Flushing Flows: A Review of Concepts Relevant to Clear Creek, California

Graham Matthews & Associates, 1999, Lower Clear Creek Floodway Rehabilitation Project Channel Reconstruction, Riparian Vegetation, and Wetland Creation Design Document

Jurisdictional Delineation of Waters of the U.S. for the Lower Clear Creek Floodway Rehabilitation Project, Phases 2-4. 1999

Western Shasta RCD, BLM, BOR, 1999, Joint CEPA Initial Study/NEPA Environmental Analysis, Mitigated Negative Declaration/Finding of No Significant Impact, Lower Clear Creek Floodway Rehabilitation Project

McBain & Trush, Graham Matthews & Associates, 1999, Lower Clear Creek Bedload Transport Measurements Technical Memo

North State Resources, 1999, Comparison of Existing and Design 100 year Flood Inundated Area & Water Surface

Western Shasta RCD, 2000, Final Report: Lower Clear Creek Spawning Gravel Restoration Projects, 1997-2000

McBain & Trush, Graham Matthews & Associates, North State Resources, August 2000, Lower Clear Creek Floodway Rehabilitation Project: Channel Reconstruction, Riparian Vegetation & Wetland Creation

Western Shasta RCD, 2001, Feasibility of Transporting Gravel Deposited in Whiskeytown Lake into Lower Clear Creek

SHN Consulting, 2002, Lower Clear Creek Floodway Rehabilitation Project Aggregate Feasibility Study

Graham Matthews & Associates, 2004, Clear Creek Floodplain Rehabilitation Project: Geomorphic Monitoring Report

Tetra Tech, Inc., 2005, Lower Clear Creek Mercury Synthesis & Data Summary Report

Souza Environmental Solutions, 2005, Lower Clear Creek Data Syntiesis

X. Supporting Documents

Western Shasta RCD, 2007, Addendum toMitigated Negative Declaration/FONSI for the Lower Clear Creek Floodway Rehabilitation Project

Western Shasta RCD, 2007, Addendum #2: Mitigated Negative Declaration/Finding of No Significant Impact for the Lower Clear Creek Floodway Rehabilitation Project

Tehama Environmental Solutions, 2007, Action Specific Action Plan: Lower Clear Creek Floodway Rehabilitation Project – Phase 3B

Western Shasta RCD, 2007, Lower Clear Creek Floodway Rehabilitation Project, Phase 3 B Modification

Graham Mathews and Associates, Executive Summary of the 2006 Update to the Clear Creek Gravel Management Plan, May 2007

BLM, Environmental Assessment Lower Clear Creek Anadromous Fish Restoration and Management Project, 2008

Definitions of Limiting Factors for Spring-Run Chinook Salmon and Steelhead

Channel Form

This attribute describes changes to the channel, including incision, aggradation, diking, armoring, and other modifications of the channel adversely affecting spring-run Chinook salmon and steelhead.

Channel Unit Types

Examples of geomorphic features of the channel that form habitat types for spring-run Chinook salmon and steelhead are pools, riffles, glides, and runs. This attribute describes changes in the frequency and size of such features. For example, removal of large wood may reduce the frequency of pools, presence of steps, or retention of gravel for riffles.

Substrate

This attribute describes changes in the composition of the substrate of the stream, including increase in fine sediment and lack of gravel recruitment.

Structure

This attribute describes the loss of structural elements in the stream such as large wood, boulders, undercut banks, and so on. Loss of structure results in a simplification of the channel and influences Channel Form and Channel Unit Types.

Flow

This attribute addresses modification of the flow regime, including decrease in summer low flow, increased "flashiness," and dewatering of the channel as a result of withdrawals.

Temperature

Change in water temperature can be attributable to human actions such as removal of riparian shading. This attribute describes the increase in summer water temperature and the loss of temperature refugia (springs or groundwater) as a result of human actions.

Water Quality

This attribute pertains to the input to the stream of toxins or pollutants that produce adverse impacts on spring-run Chinook salmon or steelhead. This can include chemical pollutants such as fertilizer and pesticides and nutrient sources such as cattle and feedlots.

Passage

This relates to the effect of impediments to adult or juvenile migration of spring-run Chinook salmon or steelhead, including dams, culverts, channel dewatering, and other structural and channel modifications. Please describe the location of the passage impediment and describe the extent of impediment (i.e., a complete or partial blockage to migration).

Riparian/Floodplain

This attribute describes the loss of functionality of the riparian forest/vegetation and the connection of the stream to the floodplain during high water and flooding.

Population Condition Definitions for Section V. Project Objectives—Biological

Increasing

Adult returns of the target species to the watershed have generally been increasing over the last several years; expectations are that the species is displaying characteristics of a rebuilding or healthy population.

Stable

Adult returns of the target species to the watershed show no clear trend over the last several years.

Decreasing

Adult returns of the target species to the watershed are declining over the last several years; the decline in abundance is a cause of concern and characteristic of a potentially unhealthy population.

Intermittent

Adult returns of the target species are occasionally seen in the watershed, but there is no viable or sustained population in the basin.

Extirpated

The population has been eliminated from the watershed although the species was present in the past.

Never Present

The species has never been known to occur in the watershed.